

**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 :

G07F 7/10, 19/00

A1

(11) International Publication Number:

WO 00/42581

(43) International Publication Date:

20 July 2000 (20.07.00)

(21) International Application Number: PCT/FI00/00020

(22) International Filing Date: 12 January 2000 (12.01.00)

(30) Priority Data:

990053

13 January 1999 (13.01.99)

FI

(71) Applicant (for all designated States except US): SONERA OYJ  
[FI/FI]; Teollisuuskatu 15, FIN-00510 Helsinki (FI).

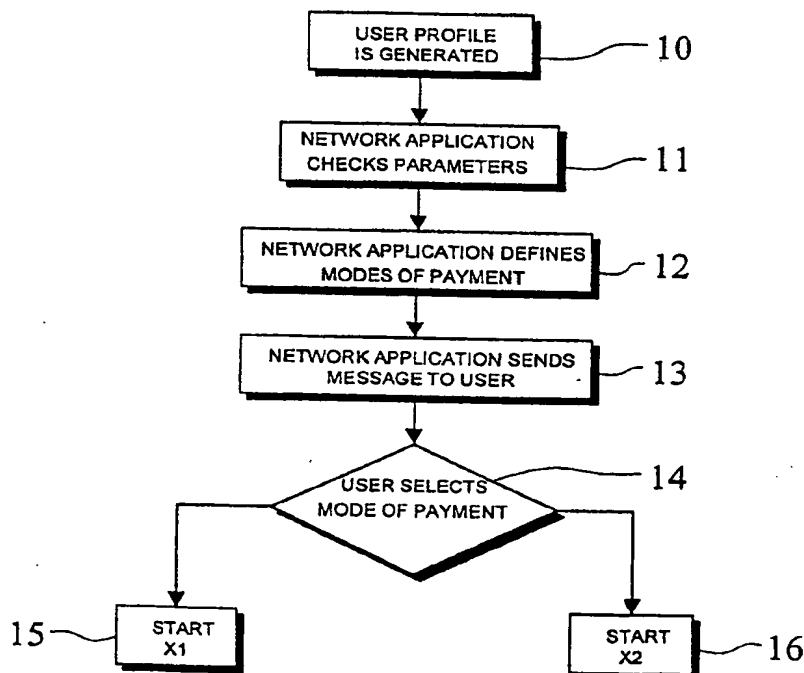
(72) Inventor; and

(75) Inventor/Applicant (for US only): LEHTO, Mariette [FI/GB];  
7 Tredegar House, 97-99 Bow Road, Bow, London, Greater  
London E3 2AN (GB).(74) Agent: PAPULA REIN LAHTELA OY; P.O. Box 981  
(Fredrikinkatu 61 A), FIN-00101 Helsinki (FI).(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG,  
BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE,  
ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP,  
KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,  
SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG,  
US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE,  
LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM,  
AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT,  
BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,  
MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GW, ML, MR, NE, SN, TD, TG).**Published***With international search report.**Before the expiration of the time limit for amending the  
claims and to be republished in the event of the receipt of  
amendments.**In English translation (filed in Finnish).*

(54) Title: METHOD AND SYSTEM FOR THE MANAGEMENT OF PAYMENT

## (57) Abstract

The invention relates to a method and system for effecting payments made by means of a mobile station in a telecommunication system, which comprises a telephone network (PLMN), a network application (1) connected to the telephone network, a mobile station (MS) connected to the telephone network via a wireless link system and a mobile station application (2). In the method, a user profile is generated in the network application (1) from the modes of payment, a mode of payment message to be sent to the mobile station (MS) is generated by the network application (1) on the basis of the user profile in a payment situation, the payment alternatives are presented on the mobile station (MS) and a response message generated on the basis of user input is sent to the network application (1). In the system, the network application (1) comprises means for generating a user profile from the modes of payment employed by the user and means for generating a mode of payment message on the basis of the user profile and for sending it to the mobile station (MS) in a payment situation, and the mobile station application (2) comprises means for presenting the payment alternatives via the mobile station (MS) and means for generating a response message to the network application (1) on the basis of user input.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

|    |                          |    |  |    |  |    |                          |
|----|--------------------------|----|--|----|--|----|--------------------------|
| AL | Albania                  | ES | Spain                                    | LS | Lesotho                                      | SI | Slovenia                 |
| AM | Armenia                  | FI | Finland                                  | LT | Lithuania                                    | SK | Slovakia                 |
| AT | Austria                  | FR | France                                   | LU | Luxembourg                                   | SN | Senegal                  |
| AU | Australia                | GA | Gabon                                    | LV | Latvia                                       | SZ | Swaziland                |
| AZ | Azerbaijan               | GB | United Kingdom                           | MC | Monaco                                       | TD | Chad                     |
| BA | Bosnia and Herzegovina   | GE | Georgia                                  | MD | Republic of Moldova                          | TG | Togo                     |
| BB | Barbados                 | GH | Ghana                                    | MG | Madagascar                                   | TJ | Tajikistan               |
| BE | Belgium                  | GN | Guinea                                   | MK | The former Yugoslav<br>Republic of Macedonia | TM | Turkmenistan             |
| BF | Burkina Faso             | GR | Greece                                   | ML | Mali   | TR | Turkey                   |
| BG | Bulgaria                 | HU | Hungary                                  | MN | Mongolia                                     | TT | Trinidad and Tobago      |
| BJ | Benin                    | IE | Ireland                                  | MR | Mauritania                                   | UA | Ukraine                  |
| BR | Brazil                   | IL | Israel                                   | MW | Malawi                                       | UG | Uganda                   |
| BY | Belarus                  | IS | Iceland                                  | MX | Mexico                                       | US | United States of America |
| CA | Canada                   | IT | Italy                                    | NE | Niger  | UZ | Uzbekistan               |
| CF | Central African Republic | JP | Japan                                    | NL | Netherlands                                  | VN | Viet Nam                 |
| CG | Congo                    | KE | Kenya                                    | NO | Norway                                       | YU | Yugoslavia               |
| CH | Switzerland              | KG | Kyrgyzstan                               | NZ | New Zealand                                  | ZW | Zimbabwe                 |
| CI | Côte d'Ivoire            | KP | Democratic People's<br>Republic of Korea | PL | Poland                                       |    |                          |
| CM | Cameroon                 | KR | Republic of Korea                        | PT | Portugal                                     |    |                          |
| CN | China                    | KZ | Kazakstan                                | RO | Romania                                      |    |                          |
| CU | Cuba                     | LC | Saint Lucia                              | RU | Russian Federation                           |    |                          |
| CZ | Czech Republic           | LI | Liechtenstein                            | SD | Sudan  |    |                          |
| DE | Germany                  | LK | Sri Lanka                                | SE | Sweden                                       |    |                          |
| DK | Denmark                  | LR | Liberia                                  | SG | Singapore                                    |    |                          |
| EE | Estonia                  |    |  |    |  |    |                          |

## METHOD AND SYSTEM FOR THE MANAGEMENT OF PAYMENT

The present invention relates to telecommunication systems. In particular, the invention concerns  
5 a method and system for the management of payments made via a mobile station.

## BACKGROUND OF THE INVENTION

Electronic payment can be effected by a wireless method e.g. by using a portable computer connected to a mobile station, a bank connection being established via an Internet link or a direct modem connection. Payment by means of a mobile station is performed using e.g. a service based on short messages, in which case the mobile station user communicates by means of short messages with a bank application connected to the telephone network. A payment application based on short messages differs from an application implemented using a computer especially in  
10 that the display of a mobile station is only capable of displaying a limited amount of information. Moreover, the data transfer capacity between a computer and a bank application is considerably higher than in the case of a short message application, so the amount of  
15 information to be transmitted does not constitute a problem like that encountered in a short message environment. On a computer display it is possible to implement a user interface in which several different ways of effecting a payment transaction are presented.  
20

30 So far, payment applications executed using a mobile station are at the initial stage of their development, so they are often difficult to use. Previously known methods of payment include individual account transfers by means of short messages, charging  
35 in conjunction with the telephone bill or money paid beforehand to a given account, so-called intelligent

card purse or net purse which is charged in conjunction with a service transaction. For the user, however, there is no handy way to select the method of payment depending on the actual situation.

5       The object of the present invention is to solve the above-mentioned problems or at least to significantly reduce them. A further object of the invention is to disclose a new type of method and system for handy control of different modes of payment using  
10 a mobile station without needless data transfer.

#### BRIEF DESCRIPTION OF THE INVENTION

      The invention concerns a method for effecting payments made by means of a mobile station in a tele-  
15 communication system, which comprises a telephone network, a network application connected to the telephone network, a mobile station connected to the telephone network via a wireless link system, and a mobile station application. The telephone network is e.g. a GSM  
20 network and the network application is implemented in an appropriate network element or elements.

      In the method of the invention, a user profile is created in the network application from modes of payment. The user profile is formed in accordance  
25 with the user's own preferences and choices, allowing the user to choose the parameters to be applied in the selection of mode of payment. By means of the network application, a mode of payment message to be sent to the mobile station is generated on the basis of the  
30 user profile in a situation where a payment is to be made. The payment alternatives derived from the user profile are presented via the mobile station to the user, whereupon the user can make his/her choice. A response message generated on the basis of user input  
35 and including the user's choice is sent to the network application.

In an embodiment of the method, the mode of payment message defines the part to be presented via the mobile station. The message may also include other information relating to the payment transaction, e.g. encryption or verification codes used by the payment application implemented in the mobile station. As the invention is preferably implemented in a service base or an application used to implement other services as well, in one embodiment a control code for identifying the network application, comprised in the mode of payment message, is defined. The control code is used to distinguish the payment application from other services in the network.

In an embodiment of the method, the response message is processed in the network application on the basis of the information in the user profile. In this case, the network application decrypts and analyzes the response message. The method preferably comprises a step wherein, after the response message has been analyzed, the mobile station is requested to supply additional information. In an embodiment, the method comprises a step wherein the network application activates a new payment program as a result of the analysis of the response message.

The invention also concerns a system for effecting payments made via a mobile station in a telecommunication system as described above. According to the invention, the network application comprises means for generating a user profile from the modes of payment applied by the user and means for generating a mode of payment message on the basis of the user profile and sending it to the mobile station in a situation where a payment is to be made. The mobile station application comprises means for presenting the payment alternatives via the mobile station and means for generating a response message and sending it to the network application on the basis of user input.

In a preferred embodiment, the system comprises means for defining the part of the mode of payment message to be presented via the mobile station. In an embodiment, the system comprises means for defining in the mode of payment message a control code identifying the network application. In an embodiment, the network application comprises means for processing the response message on the basis of user profile information. In an embodiment, the network application comprises means for requesting additional information from the mobile station. In an embodiment, the network application comprises means for activating a new payment program.

As compared with prior art, the invention provides the advantage that it makes it possible to offer the user a variety of alternatives for making a payment. The user can choose a desired mode of payment beforehand, which results in faster and easier user of the application. Functions associated with payment can be automated. The utilization of profiles makes it possible to limit the amount of information to be presented in the mobile station. User-specific information relating to payments, such as credit card numbers, can be stored in the network application, thus economizing on radio link capacity. In addition, the application logic is implemented in the network, so the invention does not impose any complicated special requirements regarding terminal equipment; in other words, the invention can be applied in various types of terminal equipment.

#### LIST OF ILLUSTRATIONS

In the following, the invention will be described by the aid of a few examples of its embodiments with reference to the attached drawing, in which

Fig. 1 presents diagram representing a system according to the invention;

Fig. 2a and 2b present examples of user profiles generated from different modes of payment; and

Fig. 3 presents a diagram representing the steps comprised in the method of the invention.

5

#### DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a diagrammatic illustration of a system according to the invention. The presentation has been simplified as many functional details are obvious to the person skilled in the art.

The system comprises a telephone network PLMN, which is e.g. a GSM network (GSM, Global System for Mobile Communications) or a similar digital mobile telephone network. The telephone network PLMN may also comprise parts of the public switched telephone network, in which case the latter is connected to the mobile telephone network with a suitable protocol, e.g. SS7 signalling (SS7, Signalling System 7), or some other common channel signalling protocol.

Connected to the telephone network PLMN is a network application 1, which is implemented e.g. in one of the network components of the telephone network, such as an intelligent network component, a mobile switching center, short message service center or USSD center, and in systems and interfaces communicating with these. The network application 1 is e.g. a service base containing the physical equipment and software, many of the means comprised in the network application 1 being implemented via software. The principal functions of the network application 1 include provision of user-specific services, management of service features, maintenance of databases and communication with the mobile station application 2.

In the case presented as an example, the network application 1 is connected to the service provider 3, which in this case means the provider of a commercial service for whose commodity the consumer is

paying by telephone, or the financial institution which takes care of the monetary transactions to be carried out in conjunction with the payment application. Connected to the telephone network is a mobile station MS via a wireless link system, which has been implemented using e.g. GSM technology. Implemented in the mobile station MS is a mobile station application 2, which is used, among other things, to implement the encryption and verification functions needed in conjunction with the payment. The mobile station application 2 is implemented e.g. in the subscriber identity module (SIM) comprised in the mobile station MS. The mobile station application 2 may also be implemented e.g. in a parallel subscriber identity module, in the mobile station software or in a system communicating with these.

The network application 1 comprises means for generating a user profile based on the modes of payment employed by the user. These means comprise a user interface by means of which the modes of payment defined for the user of the mobile station MS are transmitted to the network application 1. The means additionally comprise storage means for storing the user profiles in conjunction with the network application. The network application 1 also comprises means for generating a mode of payment message based on the user profile. The mode of payment message is transmitted to the mobile station MS e.g. as a short message or USSD message, in which case the network application 1 generates from the user profile information a message of suitable form during the payment situation. The network application 1 compares the payment transaction parameters with the user profile information, selects appropriate information from the user profiles and sends the message to the mobile station MS.

The mobile station application 2 comprises means for presenting a mode of payment message on the



mobile station MS, e.g. on the display of the mobile station. These means treat the message so that the message is in a form readily intelligible to the user. In conjunction with the mode of payment message, it is also possible to send other information, such as encryption or verification information. For user identification, it is possible to use e.g. the A-party identity transmitted in the network signalling. The mobile station 2 comprises means for filtering the information to be presented to the user from the message. The mode of payment message comprises a control code added by the network application to distinguish the mode of payment message from other network services using a corresponding method of communication.

The mobile station application 2 further comprises means for generating a response message to the network application 1. The response message is generated on the basis of feedback received from the user and processed in the mobile station application 2 to give it the form used in message transmission.

The network application 1 further comprises means for treating the response message so that the network application 1 compares the user profile information with the user's choice. The network application 1 contains stored user information needed in conjunction with payment, such as e.g. credit card numbers. The network application 1 comprises means for requesting additional information from the mobile station and means for activating a new payment program. In this case, the network application sends to the mobile station 2 a new message requesting e.g. the secret personal identity number of a bank card or corresponding account. If the user selects a mode of payment that requires another payment application, then the network application 1 activates the payment program and transmits the necessary information to it from the user profile.

Fig. 2a presents a detail of a user profile according to the invention. The modes of payment X1 - X3 are for example credit card, bank card and charging by telephone bill. The user profile defines the modes of payment used by each customer; for instance, the modes of payment defined for customer A3 are charging by credit card and charging by telephone bill.

Fig. 2b presents another detail of a user profile containing general definitions relating to the mode of payment and data indicating whether the parameter has an effect on the mode of payment or not. The alternatives M1 - M3 are e.g. amount of payment, date and product being bought. For instance, in the case of customer A1, the amount to be paid has an effect on the mode of payment such that purchases for which the sum total exceeds a given limit are to be paid for by credit card. The date parameter means for example that after a given date, e.g. at the end of a month, purchases are to be paid for by credit card. Similarly, the product being bought may have an effect on the mode of payment to be applied; for example, customer A2 pays all fuel bills by credit card but food bills by bank card.

Fig. 3 presents a flow diagram representing an example of the method of the invention. In the method, a user profile is generated in the network application 1 in accordance with the user's choices or alternative modes of payment, step 10. In a situation where a payment is to be made, the network application 1 checks the user profile and the parameters defined, step 11. The network application 1 determines the modes of payment to be offered to the user according to the payment situation, step 12. The network application 1 generates a mode of payment message of appropriate form and sends it to the user's mobile station MS, which presents the alternatives to the user, step 13. The user selects a mode of payment, whereupon the

mobile station application 2 generates a response message to be sent to the network application 1. The network application 1 continues the processing in accordance with the selection made by the user. If the database of the network application 1 already contains sufficient information required for the payment, such as the number of the credit card, then the network application 1 starts the appropriate payment application, i.e. application X1 or X2, steps 15 and 16.

To sum up, let it be stated that the present invention gives the user a new possibility to control the course of a payment transaction on the basis of his/her own choices. The network operator offers to the user only those services which the user has chosen to use or which meet the criteria relating to the actual situation. Thus, the services offered vary depending on the situation.

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined in the claims.

## CLAIMS

1. Method for effecting payments made by means of a mobile station in a telecommunication system comprising

5 a telephone network (PLMN);

a network application (1) connected to the telephone network;

a mobile station (MS) connected to the telephone network via a wireless link system; and

10 a mobile station application (2), characterized in that the method comprises steps wherein:

a user profile is generated from modes of payment in the network application (1);

15 in a payment situation, a mode of payment message to be sent to the mobile station (MS) is generated by means of the network application (1) on the basis of the user profile

the payment alternatives are presented on the mobile station (MS); and

20 a response message generated on the basis of user input is sent to the network application (1).

2. Method as defined in claim 1, characterized in that the part to be presented on the mobile station (MS) is defined in the mode of payment message.

3. Method as defined in claim 1 or 2, characterized in that a control code for identifying the network application (1), to be included in the mode of payment message, is defined.

30 4. Method as defined in any one of claims 1 - 3, characterized in that the method comprises a step wherein the response message is treated in the network application (1) on the basis of the user profile information.

5. Method as defined in any one of claims 1 - 4, characterized in that the method com-

prises a step wherein additional information is requested from the mobile station (MS).

6. Method as defined in any one of claims 1 - 5, characterized in that the method comprises a step wherein the network application (1) activates a new payment program.

7. System for effecting payments made by means of a mobile telephone in a telecommunication system comprising:

10 a telephone network (PLMN);

a network application (1) connected to the telephone network;

a mobile station (MS) connected to the telephone network via a wireless link system; and

15 a mobile station application (2), characterized in that

the network application (1) comprises means for generating a user profile from the modes of payment employed by the user;

20 the network application (1) comprises means for generating a mode of payment message on the basis of the user profile and for sending it to the mobile station (MS) in a payment situation;

25 the mobile station application (2) comprises means for presenting the payment alternatives on the mobile station (MS); and

the mobile station application (2) comprises means for generating a response message to the network application (1) on the basis of user input.

30 8. System as defined in claim 7, characterized in that the system comprises means for defining the part of the mode of payment message that is to be presented on the mobile station (MS).

35 9. System as defined in claim 7 or 8, characterized in that the system comprises means for defining in the mode of payment message a control code identifying the network application (1).

10. System as defined in any one of claims 7  
- 9, characterized in that the network ap-  
plication (1) comprises means for treating the re-  
sponse message on the basis of the user profile infor-  
5 mation.

11. System as defined in any one of claims 7  
- 10, characterized in that the network ap-  
plication (1) comprises means for requesting addi-  
tional information from the mobile station (MS).

10 12. System as defined in any one of claims 7  
- 11, characterized in that the network ap-  
plication (1) comprises means for activating a new  
payment program.

15

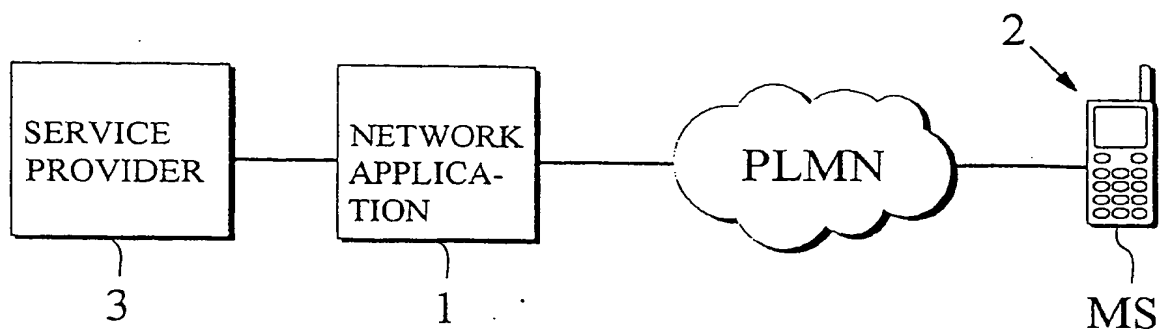


Fig. 1

|             | MODES OF PAYMENT |     |     |
|-------------|------------------|-----|-----|
|             | X1               | X2  | X3  |
| CUSTOMER A1 | YES              | YES | NO  |
| CUSTOMER A2 | NO               | NO  | YES |
| CUSTOMER A3 | YES              | NO  | YES |

Fig. 2a

|             | MODE OF PAYMENT X1 |     |     |
|-------------|--------------------|-----|-----|
|             | M1                 | M2  | M3  |
| CUSTOMER A1 | YES                | YES | NO  |
| CUSTOMER A2 | NO                 | NO  | YES |
| CUSTOMER A3 | YES                | NO  | YES |

Fig. 2b

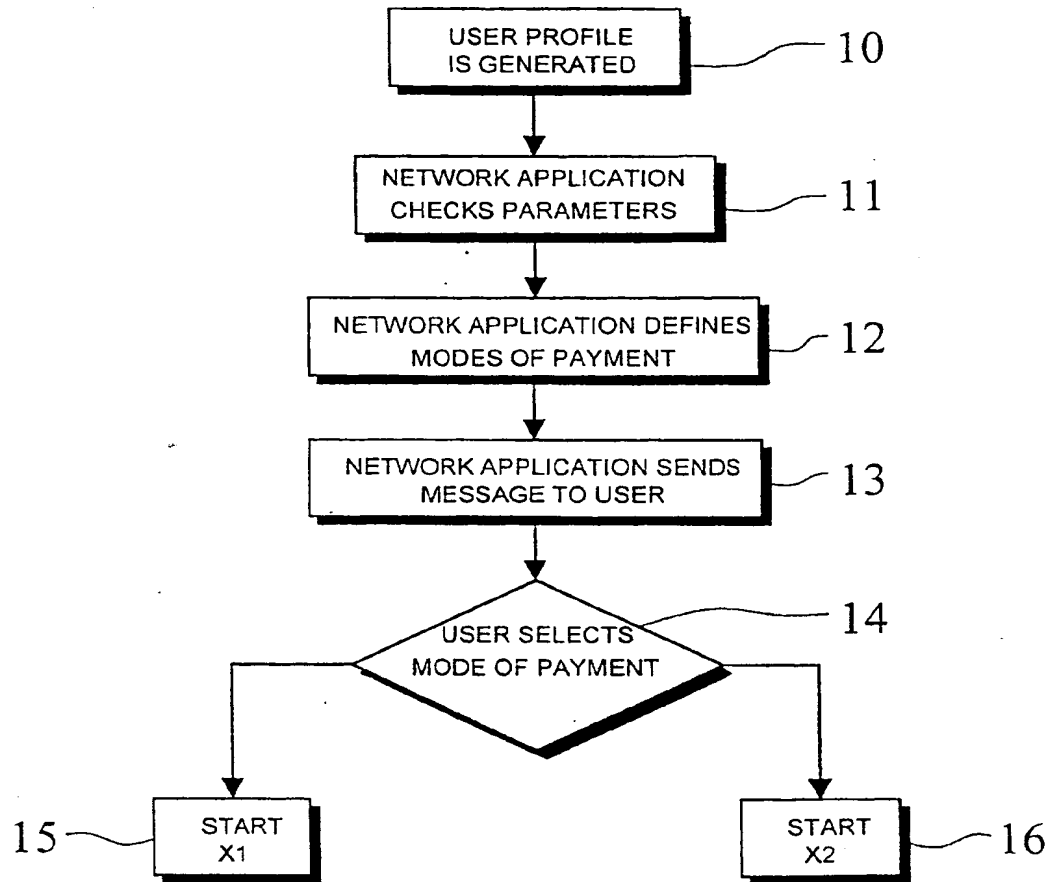


Fig. 3



1  
INTERNATIONAL SEARCH REPORT

International application No.  
PCT/FI 00/00020

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G07F 7/10, G07F 19/00  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G07F, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A         | WO 9745814 A1 (VAZVAN, B.), 4 December 1997<br>(04.12.97), abstract<br><br>-----   | 1,7                   |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

\* Special categories of cited documents:

|  |   |
|--|---|
| <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p> |
|--|---|

Date of the actual completion of the international search

11 May 2000

Date of mailing of the international search report

17-05-2000

Name and mailing address of the ISA  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Jan-Axel Ylivainio / MR  
Telephone No. +46 8 782 25 00

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

02/12/99

International application No.  
PCT/FI 00/00020

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|---------------------|----------------------------|---------------------|
| WO 9745814 A1                             | 04/12/97            | FI 962553 A                | 25/11/97            |
|   |                     | FI 970767 A                | 20/10/97            |
|   |                     | FI 971009 A                | 26/04/97            |
|   |                     | FI 971248 A                | 26/04/97            |

---